

IN THE SPECIFICATION:

On page 7, lines 1-5, please amend this paragraph as follows:

Pursuant to a particularly preferred embodiment of the invention, the carrier ring, and the rotation device that it is associated therewith, are disposed ~~between~~below the support surfaces of the support elements to prevent contaminations, especially abraded material, that is generated by the rotation device from reaching the treated substrates.

On page 7, line 17, through page 8, line 7, Iplease amend this paragraph as follows:

The apparatus preferably has at least one further group of nozzles, according to which the nozzles are differently spaced relative to the axis of rotation, and whereby the nozzles of the second group are preferably again controllable individually or in sub groups. The second group of nozzles enables the simultaneous and/or subsequent application of a further fluid, whereby the individual control enables a controlled displacement of a fluid applied by the first nozzles via a further fluid. In this connection, three groups are preferably provided in order to conduct onto the substrate, for example, a treatment fluid, a cleaning fluid, a rinsing fluid and/or a drying fluid, without ~~that the~~having to apply different fluids ~~have to be applied~~ via common nozzles. This prevents a mixing together of the various fluids in the region of the supply lines and/or of the nozzles.

On page 9, lines 8-12, please amend this paragraph as follows:

The nozzles of at least one group can preferably be supplied with fluid via a common fluid supply unit, which ensures that the nozzles of one group can be ~~controlled~~supplied with the same fluid and with essentially the same pressure. In this connection, the nozzles of at least one group can preferably be supplied with fluid via a common pressure line.

On page 16, line 15 through page 17, line 8, please amend this paragraph as follows:

The substrate carrier 1 of Fig. 2 is again provided with a planar carrier ring 5 having an inner opening 6 that is essentially greater than the outer circumference of the substrates that are

to be accommodated. Again provided on the carrier ring 5 are support elements 8 that form a multi-point support that is spaced above the carrier ring 5. With the embodiment illustrated in Fig. 2, the support elements 8 extend not only at an incline to the axis of rotation A, but also to the plane of the carrier ring 5 in order to dispose the multi-point support above the carrier ring 5 and in the region of the central opening 6. A rotational drive 10 is again provided for the carrier ring 5 and in the embodiment illustrated in Fig. 2 engages an underside of the carrier ring 5.

Again, non-illustrated mounting-bearing elements are provided for rotatably holding the carrier ring 5. The mounting-bearing elements preferably hold the carrier ring 5 in an essentially horizontal orientation in an apparatus for the treatment of semiconductor wafers, as will be described in greater detail subsequently.

On page 25, line 9 through page 26, line 15, please amend this paragraph as follows:

In the following, the operation of the treatment apparatus of Fig. 5 will be briefly described. The wafer 3 is first rotated about the axis of rotation A, via a device that is not illustrated in greater detail, as indicated by the arrow B. Subsequently, via the central nozzle 52 as well as the first nozzle group 40, a treatment fluid, such as a treatment liquid, is applied to the rotating wafer. The treatment liquid is applied to the wafer 3 in concentrically extending annular regions. As a consequence of the centrifugal force that results during the rotation, the liquid flows away outwardly and is flungscattered outwardly from the wafer surface. After a prescribed treatment time, first the central nozzle 52 is changed over to a rinsing liquid, i.e. instead of a treatment liquid now a rinsing liquid is conveyed to the wafer 3 via the central nozzle 52. In the region of the central nozzle 5, the rinsing liquid displaces the treatment liquid that is found present on the wafer. Successively, the nozzles 42a to 42g are now changed-overswitched off in order to achieve the uniform displacement of the treatment liquid. Alternatively, it is also possible to sequentially change over the nozzles 42a to 42g from the introduction of a treatment liquid to the introduction of a rinsing liquid in order to achieve a uniform displacement of the

treatment liquid from the inside toward the outside. Additionally or alternatively, rinsing liquid is additionally conveyed to the wafer via the nozzles of the second or third nozzle groups 44, 48, whereby the nozzles are respectively sequentially activated from the inside toward the outside, and in particular in conformity with the deactivation of the nozzles 42a to 42g of the first nozzle group. As a result there is achieved that the nozzle via which rinsing liquid is introduced lies closer to the axis of rotation A than the most inwardly disposed nozzle of the first nozzle group via which a treatment liquid is conveyed to the wafer. This enables a good and uniform displacement of the treatment liquid toward the outside.

On page 26, line 17 through page 27, line 10, please amend this paragraph as follows:

After the treatment liquid is completely displaced, and the wafer 3 is adequately rinsed, a drying fluid is now conveyed to the surface of the wafer 3 via the central nozzle 52. The drying fluid is, for example, an IPA/nitrogen mixture (IPA=Isopropyl Alcohol) that reduces the surface tension of the rinsing fluid disposed upon the wafer at a boundary surface or interface therebetween, and thus permits a good drying of the wafer. The drying effect proceeds from the axis of rotation A and widens radially outwardly. The nozzles that introduce the rinsing fluid are deactivated in a direction away from the axis of rotation, i.e. from the inside toward the outside. As an example, it is assumed that rinsing fluid is introduced upon the surfaces of the wafer 3 via the second nozzle group 44, i.e. initially first the nozzle 46-46a is deactivated and subsequently the nozzle 46b, etc. After the nozzle 46a is deactivated, drying fluid is introduced, for example via a nozzle, such as the nozzle 50a, that is disposed inwardly relative to the nozzle 46b, in order to enhance a uniform, radially widening drying of the wafer.

On page 27, line 12 through page 28, line 2, please amend this paragraph as follows:

The foregoing operating sequence represents only one of many possible operating sequences, since the respective nozzles of the individual nozzle groups 40, 44, 48 can respectively be individually controlled. It is therefore, for example, not necessary during a

cleaning of the wafer to use all of the nozzles of the first nozzle group, as shown by way of example in Fig. 7A. For a selective edge cleaning, for example, it is possible to use only the outer nozzles, as illustrated in Fig. 7B. Furthermore, a surface-cleaning of a surface area via a single one of the nozzles of the first nozzle group 40 is also conceivable by varying the opening spray angle of the nozzle, as indicated in Fig. 7C. It is also possible, for example, for the central nozzle alone to apply a fluid, such as a rinsing fluid, over essentially the entire surface of the wafer 3, as indicated by way of example in Fig. 7D.

On page 32, line 4 through 11, please amend this paragraph as follows:

For the treatment of the semiconductor wafer 3, it is first rotated via the substrate carrier 1 about a non-indicated central axis. By means of the nozzles 80a and 80b of the first nozzle group 80 a rinsing fluid 88, such as DI water, is conveyed onto the upper and lower sides of the wafer 3. As a consequence of the centrifugal force, a rinsing fluid is flung-scattered outwardly over the surfaces of the wafer 3 and thus covers the entire upper and lower sides of the wafer 3, as can be clearly recognized in Fig. 9A.

On page 32, line 13 through page 34, line 4, please amend this paragraph as follows:

After a certain rinsing time, as can be seen in Fig. 9B a drawing-drying fluid is applied to the upper and lower sides of the wafer 3, via the central nozzle 52, in the region of the axis of rotation. The drying fluid 90 is, for example, a fluid that reduces the surface tension of the rinsing fluid 88. As a consequence, a central drying of the wafer results. Subsequently, the nozzle 80a of the first nozzle group 80 is deactivated and the nozzle 80c is activated, so that now rinsing fluid is conveyed onto the upper and lower sides of the wafer via the nozzles 80b and 80c, as can be seen in Fig. 9C. Furthermore, by means of the nozzle 82a of the second nozzle group 82 the drying fluid 90 is now conveyed onto the upper and lower sides of the wafer 3 in order to provide a radial spreading of the central drying region. As can be seen in Figures 9D to 9F, sequentially respectively the innermost (i.e. disposed the closest to the axis of rotation)

nozzle of the first nozzle group 80 is deactivated and a more outwardly disposed nozzle is activated, in order to conduct the rinsing fluid onto the upper and lower sides of the wafer 3. In a comparable manner, respectively a nozzle of the second nozzle group 82 that is disposed further from the axis of rotation is used to conduct a drying fluid 90 to the upper and lower sides of the wafer 3 in order to provide a radially expanding drying region. With the view of Fig. 9F, rinsing fluid 88 is applied to the upper and lower sides of the wafer 3 via the two outermost nozzles 80e and 80f of the first nozzle group 80. If the nozzle 80e is now deactivated, no additional nozzle can be activated, so that the rinsing fluid 88 is conducted onto the wafer 3 exclusively via the outermost nozzle 80f, as can be seen in Fig. 9G. As can be furthermore seen in Fig. 9G, drying fluid is conducted onto the wafer 3 subsequently via the nozzles 82e of the second nozzle group 82 that are disposed inwardly relative to the nozzle 80f after the last nozzle 80f of the first nozzle group 80 is deactivated, drying fluid is conducted onto the wafer 3 via the outermost nozzle 82f, as can be seen in Fig. 9H. This ensures a complete drying of the wafer, even in the edge region of the wafer. Fig. 9 shows the apparatus 70 after termination of the drying of the wafer 3. The wafer 3 is entirely dried. All of the nozzles are in a deactivated state, and the wafer 3 can now be removed via a non-illustrated handling device.

Amendments to the Drawings:

The attached sheet of drawings (page 5 of 10), includes changes to Fig. 7D and replaces the original sheet (page 5 of 10, Figs 7A to 7D). The second attached sheet of drawings (page 10 of 10), includes changes to Fig. 10A and replaces the original sheet (page 10 of 10, Figs 10A to 10D).

Attachments: Replacement Sheet

 Annotated Sheet Showing Changes